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FILE 'USPATFULL' ENTERED AT 22:22:59 ON 06 MAY 2003  
 CA INDEXING COPYRIGHT (C) 2003 AMERICAN CHEMICAL SOCIETY (ACS)

=> s beta glucan

L1 5351 BETA GLUCAN

=> s fiber or fibre

L2 1152508 FIBER OR FIBRE

=> s l1 and l2

L3 835 L1 AND L2

=> s oil or olestra

L4 1279794 OIL OR OLESTRA

=> s l3 and l4

L5 288 L3 AND L4

=> s l5 and py<2000

L6 128 L5 AND PY<2000

=> s chips or cracker

L7 160863 CHIPS OR CRACKER

=> s l6 and l7

L8 5 L6 AND L7

=> dup rem l8

PROCESSING COMPLETED FOR L8

L9 5 DUP REM L8 (0 DUPLICATES REMOVED)

=> d l9 1-5

L9 ANSWER 1 OF 5 USPATFULL  
 AN 2002:317166 USPATFULL  
 TI Nutrient composition for exercise  
 IN Decombaz, Jacques, Lausanne, SWITZERLAND  
 Milon, Hubert, Cugy, SWITZERLAND  
 PA Nestec S.A., Vevey, SWITZERLAND (non-U.S. corporation)  
 PI US 6488955 B1 20021203  
 WO 9728700 19970814  
 AI US 1998-68710 19980730 (9)  
 WO 1997-EP448 19970127  
 PRAI EP 1996-200301 19960209  
 DT Utility  
 FS GRANTED  
 LN.CNT 590  
 INCL INCLM: 424/439.000  
 INCLS: 424/440.000; 424/441.000; 514/054.000  
 NCL NCLM: 424/439.000  
 NCLS: 424/440.000; 424/441.000; 514/054.000  
 IC [7]

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ICM: A61K047-00  
ICS: A61K009-28; A61K009-68; A61K031-715  
EXF 424/439; 424/440; 424/441; 514/54  
CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L9 ANSWER 2 OF 5 USPATFULL  
AN 96:38616 USPATFULL  
TI Calcium-enriched baked good production and method of making  
IN Zimmerman, Ellen L., Morristown, NJ, United States  
Carey, Julia M., Madison, NJ, United States  
Slade, Louise, Morris Plains, NJ, United States  
Levine, Harry, Morris Plains, NJ, United States  
PA Nabisco, Inc., Parsippany, NJ, United States (U.S. corporation)  
PI US 5514387 19960507 <--  
AI US 1994-350084 19941129 (8)  
DT Utility  
FS Granted  
LN.CNT 1648  
INCL INCLM: 426/074.000  
INCLS: 426/019.000; 426/020.000; 426/549.000; 426/654.000; 426/661.000;  
426/662.000  
NCL NCLM: 426/074.000  
NCLS: 426/019.000; 426/020.000; 426/549.000; 426/654.000; 426/661.000;  
426/662.000  
IC [6]  
ICM: A23L001-035  
ICS: A23L001-304  
EXF 426/19; 426/20; 426/549; 426/661; 426/662; 426/654; 426/74  
CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L9 ANSWER 3 OF 5 USPATFULL  
AN 94:7677 USPATFULL  
TI Effect of particle-size distribution of cellulose ethers on  
palatability  
of compositions  
IN Tobey, Stephen W., Midland, MI, United States  
PA The Dow Chemical Company, Midland, MI, United States (U.S. corporation)  
PI US 5281584 19940125 <--  
AI US 1992-843748 19920228 (7)  
DT Utility  
FS Granted  
LN.CNT 1040  
INCL INCLM: 514/057.000  
INCLS: 514/781.000; 514/884.000; 424/439.000; 424/442.000; 426/804.000;  
426/549.000  
NCL NCLM: 514/057.000  
NCLS: 424/439.000; 424/442.000; 426/549.000; 426/804.000; 514/781.000;  
514/884.000  
IC [5]  
ICM: A21D010-02  
ICS: A21D002-08; A23L001-0534; A61K031-715  
EXF 514/57; 514/781; 514/884; 424/439; 424/442; 426/804; 426/549  
CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L9 ANSWER 4 OF 5 USPATFULL  
AN 94:1225 USPATFULL  
TI Reduced-fat, ready-to-eat food item  
IN Smith, John J., Hoffman Estates, IL, United States  
PA The Quaker Oats Company, Chicago, IL, United States (U.S. corporation)  
PI US 5275830 19940104 <--

AI US 1992-901441 19920619 (7)  
 DT Utility  
 FS Granted  
 LN.CNT 805  
 INCL INCLM: 426/093.000  
 INCLS: 426/021.000; 426/020.000; 426/044.000; 426/052.000; 426/094.000;  
 426/289.000; 426/302.000; 426/618.000; 426/619.000; 426/620.000;  
 426/621.000  
 NCL NCLM: 426/093.000  
 NCLS: 426/020.000; 426/021.000; 426/044.000; 426/052.000; 426/094.000;  
 426/289.000; 426/302.000; 426/618.000; 426/619.000; 426/620.000;  
 426/621.000  
 IC [5]  
 ICM: A23L001-42  
 ICS: A23L001-29; A23L001-105  
 EXF 426/93; 426/94; 426/549; 426/618; 426/619; 426/620; 426/621; 426/20;  
 426/21; 426/44; 426/52  
  
 L9 ANSWER 5 OF 5 USPATFULL  
 AN 89:67285 USPATFULL  
 TI Method for making cereal products naturally sweetened with fructose  
 IN Maselli, John A., Winston-Salem, NC, United States  
 Neidleman, Saul L., Oakland, CA, United States  
 Antrim, Richard L., Sparta, NJ, United States  
 Johnson, Richard A., Clinton, IA, United States  
 PA Nabisco/Cetus Food Biotechnology Research Partnership, Emeryville, CA,  
 United States (U.S. corporation)  
 PI US 4857339 19890815 <--  
 AI US 1987-101561 19870928 (7)  
 DT Utility  
 FS Granted  
 LN.CNT 1717  
 INCL INCLM: 426/028.000  
 INCLS: 426/031.000; 426/044.000; 426/052.000; 426/619.000; 426/621.000;  
 426/462.000; 426/463.000; 435/094.000; 435/096.000; 435/099.000  
 NCL NCLM: 426/028.000  
 NCLS: 426/031.000; 426/044.000; 426/052.000; 426/462.000; 426/463.000;  
 426/619.000; 426/621.000; 435/094.000; 435/096.000; 435/099.000  
 IC [4]  
 ICM: A23L001-10  
 EXF 435/94; 435/96; 435/99; 426/28; 426/31; 426/20; 426/52; 426/619;  
 426/620; 426/462; 426/463; 426/18; 426/44  
 CAS INDEXING IS AVAILABLE FOR THIS PATENT.

=> s 1-5 ab kwic

L10 0 1-5 AB KWIC

=> d 1-5 ab kwic

L10 HAS NO ANSWERS

'1-5 ' IS NOT A VALID SEARCH STATUS KEYWORD

Search status keywords:

NONE ---- Display only the number of postings.

STATUS -- Display statistics of the search.

ENTER SEARCH STATUS OPTION (NONE), STATUS, OR ?:d l10

'D L37' IS NOT A VALID SEARCH STATUS KEYWORD

Search status keywords:

NONE ---- Display only the number of postings.

STATUS -- Display statistics of the search.

ENTER SEARCH STATUS OPTION (NONE), STATUS, OR ?:none

L10                    0 SEA 1-5 AB KWIC

=> d 110 1-5 ab kwic

L10 HAS NO ANSWERS

'1-5 ' IS NOT A VALID SEARCH STATUS KEYWORD

Search status keywords:

NONE ---- Display only the number of postings.

STATUS -- Display statistics of the search.

ENTER SEARCH STATUS OPTION (NONE), STATUS, OR ?:none

L10                    0 SEA 1-5 AB KWIC

=> d 19 1-5 ab kwic

L9    ANSWER 1 OF 5    USPATFULL

AB     A method of maintaining raised blood glucose levels in a mammal during  
       excise, preventing or delaying the onset of hypoglycemia during excise.  
       The method includes step of orally administering to the mammal a  
       nutrient composition containing a carbohydrate source and at least 9%

by     weight **beta-glucan**.

PI     US 6488955            B1    20021203  
       WO 9728700    19970814

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AB     . . . step of orally administering to the mammal a nutrient  
       composition containing a carbohydrate source and at least 9% by weight  
       **beta-glucan**.

SUMM   . . . in a mammal during exercise, the method comprising orally  
       administering to the mammal a nutrient composition containing  
       carbohydrate and soluble **fibre**.

SUMM   . . . onset of hypoglycaemia during exercise, the method comprising  
       orally administering to the mammal a nutrient composition containing  
       carbohydrate and soluble **fibre**.

SUMM   . . . reflux symptoms in a mammal, the method comprising orally  
       administering to the mammal a nutrient composition containing  
       carbohydrate and soluble **fibre**.

SUMM   In a yet further aspect, this invention provides the use of  
carbohydrate

and soluble **fibre** in the preparation of an orally  
administrable nutrient composition for the maintenance of raised blood  
glucose levels in a mammal. . .

SUMM   . . . exercise, or the prevention or reduction of acid reflux  
       symptoms in a mammal, the nutrient composition comprising carbohydrate  
       and soluble **fibre**.

DETD   Surprisingly, it is found that administering a nutrient composition  
       which contains carbohydrate and an effective amount of soluble  
       **fibres** to a mammal results in a relatively small increase in the  
       blood glucose of the mammal and that this raised. . . delayed which  
       enables an increase in performance. If a nutrient composition  
containing

an equivalent amount of carbohydrate, but without soluble **fibre**  
, is administered, the blood glucose levels of the mammal rapidly  
increase to a peak and then rapidly decrease upon onset. . .

DETD   It is also surprisingly found that orally administering a nutrient  
       composition which contains carbohydrate and an effective amount of  
       soluble **fibre** prevents or delays the onset of the symptoms of  
       acid reflux.

DETD   Preferably the nutrient composition contains at least 2% by weight  
       soluble **fibre**; more preferably at least 5% by weight soluble  
       **fibre**; for example about 8 to about 15% by weight soluble

**fibre.**

- DETD Preferably the nutrient composition includes a **fibre** rich cereal which provides carbohydrate and the soluble **fibre**. Preferably the **fibre** rich cereal contains at least about 10% by weight of soluble **fibre** and at least about 25% by weight of total **fibre**. More preferably the **fibre** rich cereal contains at least about 14% by weight soluble **fibre** and at least about 30% by weight of total **fibre**. The **fibre** rich cereal is preferably an oat bran concentrate or a barley flour; more preferably a de-fatted oat bran or barley. . . .
- DETD The **fibre** rich cereal is preferably provided in the form of an extrusion cooked cereal. In this form, the **fibre** rich cereal has the advantage that it is in a ready to eat form and has acceptable taste and texture.. . .
- DETD . . . composition administered is preferably sufficient to provide about 0.03 g to about 0.3 g per kg body weight of soluble **fibre** ; more preferably about 0.05 g to about 0.2 g per kg body weight of soluble **fibre**. For example, the amount of soluble **fibre** administered may be about 0.07 g about 0.15 g per kg of body weight. The amount of carbohydrate administered is. . . .
- DETD . . . content. Breakfast A is a maltodextrin solution. Breakfast B is
- a mixture of maltodextrin solution and snack bars containing soluble **fibre**, and Breakfast C is made up of snack bars containing soluble **fibre**. Certain athletes remain at rest and are fed Breakfast C.
- DETD To produce the nutrient composition, a soluble **fibre** source is required. Any suitable source of soluble **fibre** may be used. However, the source of soluble **fibre** is conveniently selected to be compatible with the form of the nutrient composition desired. For example, if the nutrient composition is to be in the form a breakfast cereal, a snack bar, a cookie, a biscuit, a **cracker**, a bread or bread-like product, etc, the soluble **fibre** is conveniently provided in the form of a **fibre** rich cereal or a **fibre** rich bean concentrate.
- DETD For convenient, ready-to-eat foods such as snack bars, the soluble **fibre** is best provided in the form of a **fibre** rich cereal. For simplicity, the invention will be described in detail in relation to the use of **fibre** rich cereals as a soluble **fibre** source. However, it will be appreciated that the invention is not limited to the use of **fibre** rich cereals. For other sources of soluble **fibre**, procedures known in the art may be used to produce the nutrient compositions.
- DETD For best results when using a **fibre** rich cereal, the **fibre**-rich cereal has a total **fibre** content of at least 25% by weight and a soluble **fibre** content (the soluble **fibre** being predominantly **.beta.-glucan**) of at least 10% by weight. The **fibre** rich cereal may be any suitable cereal; for example oat or barley. Particularly suitable is
- oat
- bran concentrate but barley. . . .
- DETD In this specification, a "de-fatted oat bran concentrate" means an oat bran fraction which has a soluble **fibre** content of above about 10% by weight and which has been subjected to solvent extraction to remove, at least partially, **oils** and fats from the fraction. Ordinarily, oat bran concentrates have a fat or **oil** content of greater than about 10% by weight. De-fatted oat bran concentrates have an **oil** or fat content of less than about 7% by weight: more usually about 4% to about 6% by weight. De-fatted. . . .
- DETD . . . Varobacka, Sweden. Alternatively the oat bran concentrate may

be prepared by grinding dry oat grains and then carefully screening the **fibre** material from the starchy components of the oat grains. The **fibre** rich material may then be subjected to solvent extraction techniques to remove **oils** and fats from the material. A suitable procedure for the extraction of **oils** and fats is disclosed in British patent 1,526,553; the disclosure of which is incorporated by reference. The solvent extraction step. . . out prior to screening if desired. This screening and extraction procedure would be suitable for producing oat bran concentrates with **fibre** contents at the lower end of the range; for example an oat bran concentrate having a maximum soluble **fibre** content of about 15% by weight.

DETD . . . at a temperature of 0 to 15.degree. C. The slurry is then homogenised and then screened to separate off a **fibre** rich fraction. The **fibre** rich fraction may then be subjected to extraction to remove **oils** and fats. Using this technique, oat bran concentrates having a soluble **fibre** content of up to about 40% by weight may be prepared. Although oat bran concentrates having very high soluble **fibre** contents may be used to produce the nutrient composition, it is preferred if the soluble **fibre** content is less than about 20% by weight.

DETD To produce the nutrient composition, a dry mix containing the **fibre** rich cereal is formed. The dry mix will comprise at least 50% by weight of the **fibre** rich cereal; the exact amount depending upon the desired form and desired properties of the nutrient composition.

DETD . . . is used is selected to provide the desired properties in the nutrient composition. However it is best that the soluble **fibre** content of the nutrient composition is above about 5%. If it is desired to provide a highly expanded product, greater amounts of the starchy, farinaceous ingredient or starch will be needed. In this case, the soluble **fibre** content of the nutrient composition may be maintained above about 5% by weight by using an oat bran concentrate with a high soluble **fibre** content. However, for a oat bran concentrate which has a soluble **fibre** content in the range of about 15 to about 20% by weight, the starchy, farinaceous ingredient or starch conveniently comprises. . .

DETD . . . and the like. Suitable protein sources are milk powders, whey powders, wheat glutens etc. If desired, further sources of insoluble **fibre** may also be included; for example wheat bran, corn bran, rice bran, rye bran and the like.

DETD . . . mixed to provide a homogeneous mix and are then fed to a suitable cooker to increase the palatability of the **fibre** rich cereal; for example an extruder-cooker. Any suitable extrusion cooker may be used; single crew or twin screw. Suitable extrusion. . .

DETD If desired, a very small amount of an edible **oil** may be fed into the extruder-cooker to facilitate the extrusion process or as carriers for **oil** soluble additives. Any suitable **oil** may be used; for example vegetable **oils** such as sunflower **oil**, safflower **oil**, corn **oil**, and the like.

If **oils** are used, **oils** which are high in mono-unsaturates are particularly preferred. Hydrogenated **oils** or fats are also preferred. The amount of **oil** used is preferably kept below about 1% by weight of the mixture of **oil**, dry mix and water.

DETD . . . screw or screws is preferably kept below about 500 rpm. Above about 500 rpm, it is found that the soluble **fibres** are degraded due to the high shear and the end product produces lower viscosities in the stomach and small intestine.. . .

DETD . . . the nutrient composition may be formulated into a convenience

food such as a snack bar, a cookie, a biscuit, a **cracker**, a muffin and the like. Again the nutrient composition may be mixed with nuts, dried fruit, sugars or other sweeteners, . . .

DETD . . . smaller increase in blood glucose levels than other food compositions which contain an equivalent amount of carbohydrates but no soluble **fibre**. However, the raised blood glucose levels induced by the nutrient composition remain substantially constant over extended periods in comparison. In. . .

DETD . . . the age, health and fitness of the individual, the body weight of the individual, the amount of carbohydrate and soluble **fibre** in the nutrient composition, the duration of the exercise, and the like.

In any event, the correct amount for any. . . composition sufficient to supply a dose of about 0.03 g to about 0.3 g per kg body weight of soluble **fibre** is usually adequate. More preferably about 0.05 g to about 0.2 g per kg body weight of soluble **fibre** is administered; for example, the amount administered may be about 0.07 g about 0.15 g per kg of body weight.

DETD . . . is prepared. The oat bran concentrate is obtained from Swedish Protein AB, Varobacka. Sweden and contains about 35% total dietary **fibre** and about 17% soluble **fibre**.

DETD . . . about 2.3% using air at about 120.degree. C. The dried flaked food product has a crispy, pleasant texture, a dietary **fibre** content of about 29% and a soluble **fibre** content of about 14%. The product has a good mouthfeel.

DETD The bars have a **.beta.-glucan** content of about 10% by weight, a protein content of about 11% by weight, a total **fibre** content of about 20% by weight, a fat content of about 10% by weight, and a carbohydrate content of about. . .

DETD . . . hazel nuts and has a chocolate coating, and Type 6 is the bar of example 1. For all Types, soluble **fibre** content is about 9% to about 11% by weight, total **fibre** content is about 19% to about 21% by weight, carbohydrate content is about 40% to about 49% by weight, protein. . .

DETD . . . 7 am containing about 900 kcal of energy of which about 580 comes from carbohydrates. The breakfast contains no soluble **fibre**. The swimmer then begins swimming and continues until 8 pm. During the day, the swimmer ingests a snack of 3. . . 3 pm containing about 480 kcal of energy of which about 280 comes from carbohydrates. The meal contains no soluble **fibre**. Blood glucose levels are taken at each hour during the day.

DETD The Type 1 bar of example 3 is used. The bar has a soluble **fibre** content of about 10% by weight, a total **fibre** content of about 20% by weight, a carbohydrate content of about 46% by weight, a protein content of about 14%. . .

CLM What is claimed is:

. . . mammal, the method comprising orally administering to the mammal a nutrient composition containing carbohydrate and at least 9% by weight **beta-glucan**.

2. The method of claim 1 wherein the nutrient composition contains at most 15% by weight **beta-glucan**.

7. The method of claim 1 wherein the nutrient composition includes a **fibre** rich cereal which provides carbohydrate and the **beta-glucan**; the **fibre** rich cereal containing at least 14% by weight **.beta.-glucan** and at least 30% by weight of total **fibre**.

8. The method of claim 7 wherein the **fibre** rich cereal is in the form of an extrusion cooked cereal.

10. The method of claim 9 wherein the nutrient composition contains at most 15% by weight **beta-glucan**.

15. The method of claim 9 wherein the nutrient composition includes a **fiber** rich cereal which provides carbohydrate and the betaglucan; the **fiber** rich cereal containing at least 14% by weight betaglucan and at least 30% by weight of total **fiber**.

16. The method of claim 15 wherein the **fiber** rich cereal is in the form of an extrusion cooked cereal.

. . . A method of improving performance during an exercise, the method comprising orally administering to a mammal during the exercise a **beta-glucan** enriched nutrient composition containing carbohydrate wherein the amount of **beta-glucan** is at least 9% by weight of the nutrient composition.

18. The method of claim 17 wherein the nutrient composition contains at most 15% by weight **beta-glucan**.

23. The method of claim 17 wherein the nutrient composition includes a **fiber** rich cereal which provides carbohydrate and the **beta-glucan**; the **fiber** rich cereal containing at least 14% by weight **beta-glucan** and at least 30% by weight of total **fiber**.

L9 ANSWER 2 OF 5 USPATFULL

AB The calcium content of **crackers** and other baked goods is substantially increased without adversely affecting texture by the use of an emulsifier composition to reduce hardness and dry mouthfeel caused

by increased levels of calcium. Exemplary amounts of the emulsifier composition for achieving tenderization of the calcium fortified **crackers** and other baked goods may be from about 3% by weight to about 45% by weight, based upon the weight of the calcium component. Calcium carbonate is the preferred calcium enrichment component. The amount of the calcium enrichment component for providing more than 10% of the U.S. R.D.A. of 1000 mg of calcium per 15 gram serving may be

from about 3% by weight to about 30% by weight, preferably from about 5% by weight to about 15% by weight, based upon the total weight of the flour.

For making conventional or full-fatted baked goods such as **crackers**, the calcium enriched doughs of the present invention contain effective emulsifying amounts of: a) at least one polyoxyethylene sorbitan fatty acid ester, preferably polysorbate 60, and b) at least one stearyl lactylate, preferably sodium stearyl lactylate. The reduced fat, low-fat, and no-fat calcium enriched doughs of the present invention most preferably additionally contain at least one lecithin. Other full-fat, reduced fat, low-fat, and no-fat baked goods may be fortified with calcium in accordance with the present invention include cookies, brownies, snacks, snack **chips**, bagel **chips**, Melba toast, pretzels, and the like.

PI US 5514387

19960507

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AB The calcium content of **crackers** and other baked goods is substantially increased without adversely affecting texture by the use of an emulsifier composition to reduce. . . mouthfeel caused by increased levels of calcium. Exemplary amounts of the emulsifier composition for achieving tenderization of the calcium fortified **crackers** and other baked goods may be from about 3% by weight to



about 45% by weight, based upon the weight. . . 15% by weight, based upon the total weight of the flour. For making conventional or full-fatted baked goods such as **crackers**, the calcium enriched doughs of the present invention contain effective emulsifying amounts of: a) at least one polyoxyethylene sorbitan fatty. . . and no-fat baked goods may be fortified with calcium in accordance with the present invention include cookies, brownies, snacks, snack **chips**, bagel **chips**, Melba toast, pretzels, and the like.

SUMM The present invention relates to the tenderization of calcium-enriched **crackers** and other baked goods produced on a mass production, continuous basis. The calcium fortified baked products produced in accordance with the present invention include conventional or full-fatted **crackers**, snacks, cookies, pretzels and snack **chips**, and reduced fat, low-fat, and no-fat baked goods.

SUMM . . . 4,765,996 polished rice or barley is enriched with nutrients which are fixed in and on the grain by coating an oil/fat and/or a wax on the grains, coating the same with a hydrophilic emulsifier and further coating them with a starch-based. . .

SUMM Calcium compounds have been utilized in baked goods, such as **crackers**, as components of leavening agents, pH adjusters, yeast foods, and for their nutritive value. U.S. Pat. No. 4,196,226 discloses a. . . al discloses the use of calcium and ammonium carbonates and bicarbonates in leavening systems for the production of reduced calorie **crackers**. Various emulsifiers are disclosed as replacements for fat. Magnesium and/or calcium carbonates are taught as acid-neutralizing constituents in British patent. . . The dough-up stage addition of calcium carbonate for its nutritive value in the production of reduced fat or no-added fat **crackers**, is disclosed in U.S. Pat. No. 5,108,764 to Craig. U.S. Pat. Nos. 4,859,473 and 5,066,499 to Arciszewski et al disclose the addition of calcium carbonate to the dough-up stage for its nutritive value in the production of low sodium **crackers**.

SUMM The delivery of dietary calcium using **crackers** and other low moisture content baked goods as a medium has significant advantages over the use of milk, other dairy products such as yogurt, beverages, tofu, and whole grains. **Crackers** generally exhibit much longer shelf lives than do dairy products such as milk and yogurt. Settling out of calcium salts from solution or suspension during product storage is not encountered when using **crackers** as a dietary source of calcium. Also, **crackers** and other baked goods have broad appeal to many segments of the population. However, commercially available **crackers** generally provide only up to about 3% of the U.S. R.D.A. of calcium per serving. It has been found that the incorporation of calcium in **crackers** in amounts to provide more than 10% of the U.S. R.D.A. of 1000 mg calcium per serving results in a hard **cracker** texture.

SUMM Also, reducing the fat content of **crackers** and other baked goods results in a harder texture as disclosed in copending, commonly assigned U.S. application Ser. No. 08/351,059. . .

SUMM In producing **crackers** on a mass production basis, a **cracker** dough must be continuously sheetable, and it should preferably be capable of being laminated upon itself. The baked product should. . .

SUMM . . . absence of fat, but water cannot be used as the sole means to provide tenderness to the final product. Fat-free **crackers** made only with water as the fat replacement are flinty and so absorptive

as to cause unpleasant dryness in the. . .

SUMM As disclosed in U.S. Pat. No. 5,108,764 to Craig, et al., a major  
source of the textural problem in **crackers** is believed to be excessive gelatinization of starch in **crackers** made with extra water without adding fat. Excessive gelatinization of starch during baking makes the **cracker** flinty and very moisture-absorbent. Retention of water in the **cracker** dough during baking causes excessive gelatinization and the resultant inferior **cracker**. Thus, when preparing **crackers**, unlike preparing bread, starch gelatinization is to be limited. For example, in full-fatted **crackers**, 75% of the starch may be gelatinized. Removal of the fat may result in an increase of gelatinization to 85%. . .

SUMM In the process of U.S. Pat. No. 5,108,764, the added fat or shortening content of a mass-produced **cracker** is reduced using water and an enzyme composition that hydrolyses non-cellulosic cell wall polysaccharides. The enzymatic treatment and the amount. . .

SUMM . . . present invention, an emulsifier composition is used to  
provide an unexpectedly soft and tender texture and enhanced flavor to calcium-enriched **crackers** and other baked products which provide more than 10% of the U.S. R.D.A. of 1000 mg of calcium per serving. The tenderized calcium fortified **crackers** and other baked goods of the present invention include calcium enriched reduced fat, low-fat, and no-fat baked products as well as conventional, full-fatted **crackers** and other baked goods which contain substantial amounts of ungelatinized starch. Dough lay times and dough machinability are not adversely. . .

SUMM The calcium content of **crackers** and other baked goods is substantially increased without adversely affecting texture by the use of an emulsifier composition to reduce. . . mouthfeel caused by increased levels of calcium. Exemplary amounts of the emulsifier composition for achieving tenderization of the calcium fortified **crackers** and other baked goods may be from about 3% by weight to about 45% by weight, based upon the weight of the calcium component. In conventional or full-fatted **crackers** and other baked goods, emulsifier amounts at the lower end of the range are generally used. Exemplary amounts of the. . . by both calcium enrichment and fat reduction. For example, exemplary amounts of the emulsifier for use in calcium enriched no-fat **crackers** and other baked goods may range from about 15% by weight to about 45% by weight, based upon the weight of the calcium component. The calcium-enriched **crackers** and other baked goods of the present invention provide more than 10%, preferably at least 20% of the U.S. R.D.A.. . .

SUMM . . . pH, flavor, or color of the baked goods. In addition, the calcium component, added in the dough-up stage of fermented **crackers** or other fermented baked goods, preferably does not interfere with neutralization of acids produced during fermentation.

Low solubility of the. . .

SUMM In preferred embodiments for making conventional or full-fatted baked goods such as conventional **crackers**, the calcium enriched doughs of the present invention contain effective emulsifying amounts of: a) at least one polyoxyethylene sorbitan fatty. . .

SUMM . . . 100% by weight. The three component emulsifier compositions  
may also be used in the preparation of conventional or full-fatted calcium-enriched **crackers** and other full-fatted calcium enriched baked goods.

SUMM The unexpectedly soft, tender, non-brittle texture of calcium enriched

**crackers** of the present invention lasts for extended periods of time, for example, at least two months, preferably at least six. . . and the calcium component does not impart a chalky flavor or dry mouthfeel to the baked good. In preferred embodiments, **cracker** flavor is enhanced by the use of a natural flavorant.

SUMM The **crackers** produced in accordance with the present invention may be chemically leavened or unfermented full-fat, reduced fat, low-fat, or no-fat **crackers**. Fermented **crackers**, such as soda **crackers**, which are full-fatted or having reduced fat, low-fat or no added fat may also be produced in accordance with the. . . no-fat baked goods which may be fortified with calcium in accordance with the present invention include cookies, brownies, snacks, snack **chips**, bagel **chips**, Melba toast, pretzels, and the like.

SUMM The calcium content of **crackers** and other baked goods is substantially increased in accordance with the present invention by blending into a dough or batter. . . least six months, in proper, air-tight packaging. In embodiments of the present invention the calcium level of conventional or full-fatted **crackers**, reduced fat **crackers**, low- fat **crackers** and no-fat **crackers** may be increased from approximately 0-3% of U.S. R.D.A. per 15 gram serving or reference amount to a product containing. . . may also be achieved in other full-fat, reduced fat, low-fat, and no-fat baked goods such as cookies, brownies, snacks, snack **chips** or chip-like products, bagel **chips**, Melba toast, pretzels, and the like.

SUMM . . . the baked product which reduces the detection of any off-flavors. The source of calcium for providing calcium enrichment to the **crackers** of the present invention is preferably an insoluble, tasteless or bland, alkaline calcium salt or compound which does not adversely. . . pH, flavor, or color of the baked good. In addition, the calcium component, added in the dough-up stage of fermented **crackers** or other fermented baked goods, preferably does not interfere with the desired neutralization of acids produced during fermentation. Exemplary of. . . carbonate, tricalcium phosphate, and mixtures thereof. Calcium carbonate is the most preferred calcium component for enriching the calcium content of **crackers** in accordance with the present invention.

SUMM . . . may be used provided they do not adversely affect flavor, appearance or texture, or calcium absorption. In full-fatted or conventional **crackers** or other baked goods which have not had their fat content substantially reduced, excessive use of emulsifiers may deleteriously affect dough machinability or baked good quality. For example, excessive use of emulsifiers may undesirably decrease **cracker** crispness, increase blistering, create a non-uniform cell structure, or provide excessive softness or fragility for mass packaging operations.

SUMM . . . is soluble in water, aniline, ethyl acetate, and toluene, but is soluble only at low levels in mineral and vegetable **oils**. Polysorbate 60 is commercially available under the trademark Tween 60 from ICI-Atlas.

SUMM . . . bitter taste. It is very soluble in water, producing an odorless, nearly colorless solution, and is soluble in ethanol, cottonseed **oil**, corn **oil**, methanol, ethyl acetate and toluene. Polysorbate 80 is commercially available under the trademark Tween 80 from ICI-Atlas.

SUMM . . . derived from plants such as soybean, rapeseed, sunflower, or corn, and those derived from animal sources such as egg yolk. Soybean-**oil**-derived lecithins are preferred.

SUMM . . . for use in the present invention. Commercial grades generally contain about 2.2% phosphorus. Lecithin is prepared commercially primarily from soybean **oil**. It exists preformed as a contaminant in crude soybean **oil**, and the commercial method of preparation involves precipitation from the **oil** and subsequent purification. It may be further processed by bleaching, fractionation, hydrolysis, acetylation, extraction, hydroxylation, and the like. Soybean lecithin. . .

SUMM In preferred embodiments of the present invention, commercially available, fluidized, soybean-**oil**-derived lecithin is employed. Exemplary of a preferred fluid lecithin is an unbleached lecithin, derived from the phosphatides of phospholipids of soybean **oil**, which is semi-solid but pourable at room temperature. The Brookfield viscosity at 77.degree. F. of the **oil**-based product may be about 5500 (±.200) cps, and it may be light tan to yellow in color. The moisture content. . .

SUMM Exemplary amounts of the emulsifier composition for achieving tenderization of the calcium fortified **crackers** or other baked goods may be from about 3% by weight to about 45% by weight, based upon the weight. . . and fat reduction. For example, exemplary amounts of the emulsifier for use in calcium enriched no-fat baked goods such as **crackers**, may range from about 15% by weight to about 45% by weight, based upon the weight of the calcium component.

SUMM . . . has a fat content of less than 0.5 grams of fat per reference amount and per label serving. For accompaniment **crackers**, such as a saltine **cracker**, the reference amount is 15 grams. For **crackers** used as snacks and for cookies, the reference amount is 30 grams. Thus, the fat content of a low-fat **cracker** or cookie would therefore be less than or equal to 3 grams of fat per 50 grams or less than or equal to about 6% fat, based upon the total weight of the final product. A no-fat accompaniment **cracker** would have a fat content of less than 0.5 grams per 15 grams or less than about 3.33%, based upon. . .

SUMM . . . any known shortening or fat blends or compositions useful for baking applications, and they may include conventional food-grade emulsifiers. Vegetable **oils**, lard, marine **oils**, and mixtures thereof, which are fractionated, partially hydrogenated, and/or interesterified, are exemplary of the shortenings or fats which may be. . . such as sucrose polyesters, which are process-compatible may also be used. Mixtures of hard and soft fats or shortenings and **oils** may be used to achieve a desired consistency or melting profile in the oleaginous composition. Exemplary of the edible triglycerides. . . the oleaginous compositions for use in the present invention include naturally occurring triglycerides derived from vegetable sources such as soybean **oil**, palm kernel **oil**, palm **oil**, rapeseed **oil**, safflower **oil**, sesame **oil**, sunflower seed **oil**, and mixtures thereof. Marine and animal **oils** such as sardine **oil**, menhaden **oil**, babassu **oil**, lard, and tallow may also be used. Synthetic triglycerides, as well as natural triglycerides of fatty acids, may also be. . . F. to about 95.degree. F. may be used. Preferred oleaginous compositions for use in the present invention comprise purified soybean **oil** in which the lecithin has been removed during purification. The shortening or fat content of the calcium enriched **cracker**

doughs of the present invention may range from about 0 to about 40% by weight, based upon the weight of the dough. The shortening or fat content of the calcium enriched **cracker** doughs is generally less than about 12% by weight, based upon the weight of the dough.

SUMM . . . total weight of all ingredients forming the doughs or formulations of the present invention, except for inclusions such as flavor **chips**, nuts, raisins, and the like. Thus, "the weight of the dough" does not include the weight of inclusions.

SUMM . . . mixtures thereof, and the like may also be substituted in whole

or in part for the flour, for making a **fiber**-enriched product, to enhance color, or to affect texture.

SUMM . . . 50% by weight, preferably less than about 35% by weight, based upon the weight of the dough or batter. The **cracker** doughs of the present invention generally have a moisture content of about 25% by weight to about 33% by weight, . . .

SUMM . . . to limit starch gelatinization. In embodiments of the present invention, the water content of a full-fat, reduced-fat, low-fat, or no-fat **cracker** dough may be reduced: a) without substantially increasing the viscosity or consistency of the dough, and b) without substantially increasing. . .

SUMM In addition to the foregoing, the doughs of the invention may include other additives conventionally employed in **crackers** and cookies. Such additives may include, for example, milk by-products, egg or egg by-products, cheese, cocoa, vanilla or other flavorings, as well as inclusions such as nuts, raisins, coconut, flavored **chips** such as chocolate **chips**, butterscotch **chips** and caramel **chips**, and the like in conventional amounts.

SUMM . . . of the present invention, enzymatic treatment may be used to alter the water-holding non-cellulosic, cell-wall polysaccharides such as pentosans and/or **beta-glucans** in the dough environment. Pentosans, for example, hold a lot of water, even though they amount to only a minor. . .

SUMM . . . so they preferably should not be admixed with the enzyme in a concentrated manner. For example, in producing an unfermented **cracker**, the leavening agent is preferably well dispersed with the other ingredients, prior to the addition of the enzyme.

SUMM . . . machinable calcium enriched, full-fat, no-fat, low-fat, and reduced-fat doughs of the present invention are continuously sheetable using counter-rotating rolls. The **cracker** dough sheet can be continuously laminated upon itself to form from 3 to 8 laminae, for example. The laminated **cracker** doughs are capable of being reduced in thickness by counter-rotating rolls, to obtain a sheet which may be cut into. . . or polycarbonate cutters, or plastic-coated steel cutters, such as Teflon-coated steel cutters, may be used to reduce dough adherence. Conventional **cracker** manufacturing equipment, such as gauge rollers, laminators, and cutters, may be used in the present invention.

SUMM . . . activity") of less than about 0.7, preferably less than about 0.6, to assure microbial shelf-stability. The water content of the **cracker**, snack, snack or fabricated chip, pretzel, bagel chip, and Melba toast products is generally less than about 6% by weight, . . . 4% by weight, based upon the weight of the baked product, exclusive of inclusions. The pH of the calcium enriched **crackers** may generally be from about 6.4 to about 8.8.

SUMM . . . by differential scanning calorimetry) in the baked products of the present invention may generally be less than about 80% for **crackers** and snacks and less than about 10% for cookies.

SUMM Fermented **Cracker** Production

SUMM Conventional or full-fat calcium enriched **crackers** and

fat-free, reduced-fat, and low-fat fermented calcium enriched **crackers** are produced using a sponge stage and a dough-up stage. The basic ingredients in the preparation of a sponge are. . .

SUMM . . . enzyme, from about 0 to about 2% by weight yeast food, from about 0 to about 3% by weight of **cracker** meal, and from about 0 to about 2% by weight of starter or ferment. All percentages are based upon the. . .

SUMM . . . times (also referred to herein as sponge times) are those conventionally used in the art. In the case of soda **crackers** or saltines, and the many variants of these products, such as oyster (soup) **crackers**, club **crackers**, cheese **crackers**, and the like, sponge times of about 2 to 24 hours are typically used.

SUMM . . . dough ingredients for mixing into the fermented sponge generally include flour and sodium bicarbonate. In producing full-fat, reduced-fat or low-fat **crackers**, the shortening or fat may also be added in the dough-up stage. The addition of fat or shortening in the. . .

SUMM . . . dough of substantial homogeneity. After mixing, the dough is proofed, or allowed to ferment further, as is conventional in the **cracker** art. The viscosity of the dough is also decreasing during this time. Typical proofing times range from about 2 hours. .

SUMM The proofed dough is machined and baked in the conventional manner for the preparation of fermented **crackers**. Soda **crackers**, for example, may be formed from a continuous sheet of dough which is laminated or lapped before being cut. The. . . formed by a stamping device, such as a reciprocating cutter or rotary cutter, which does not entirely sever the individual **crackers** from the sheet. The **crackers** remain in a substantially continuous sheet through the band oven. The cutter may also puncture the dough pieces to form dock holes for the prevention of uneven or excessive expansion in the oven. After baking, the individual **crackers** are separated from the substantially continuous sheet. The optional topping salt is generally applied after stamping and before baking.

SUMM . . . to a moisture content of about 2% to about 4 % by weight, based upon the final weight of the **cracker**. In embodiments of the invention optional topping or spray oil may be applied to the baked product.

SUMM A problem may arise with the shelf-life of fat-free **crackers**. They can go rancid more rapidly than **crackers** made with fat. This is believed to be because fat or shortening retards oxygenation and peroxide formation at points of. . . grains such as wheat and wheat products such as flour. It is these lipids which can go rancid when fat-free **crackers** are made. At some point in the process, an antioxidizing agent such as naturally occurring anti-oxidants, including citric acid or. . .

SUMM Unfermented **Cracker** Production

SUMM In preparing full-fat, no-fat, low-fat, and reduced-fat, unfermented calcium enriched **crackers** by the method of the present invention, the ingredients used may be basically the same as when preparing fermented **crackers**, except that no yeast or bacteria is employed. Thus, the ingredients of the dough may comprise flour, water, optional shortening. . . a food-grade acidic compound to effect leavening. Proteolytic, amylolytic, and pentosanase enzymes may be used. The flour used in unfermented **crackers** does not

generally need to be as strong as the sponge flour used in fermented **crackers**, although the flour should be moderately strong. Advantageously, the dough used to prepare the unfermented **crackers** comprises malt.

SUMM In addition to the aforementioned ingredients, doughs used to prepare unfermented **crackers** of the snack type by the method of the present invention may contain one or more sugars. For example, the.

SUMM When producing unfermented **crackers** by the method of the present invention, the conventional mixing steps of a creaming stage followed by a dough-up stage.

SUMM If flavor **chips** or fruit pieces are to be added to the cookie dough or batter, they are preferably added, as the last ingredient, to the dough with minimal mixing, so as to avoid smearing of the flavor **chips** or pieces into the dough or batter.

SUMM . . . by weight or more, based upon the weight of the baked good, inclusive of fillers and inclusions such as flavor **chips**, raisins and fruit pieces. For example, a fruit-filled, soft, moist cookie or cake may have a moisture content of about.

DETD The ingredients and their relative amounts, which may be used to produce

a calcium enriched, full-fat or conventional, fermented **cracker** dough bakeable to a **cracker** which provides at least 20% of the U.S. R.D.A. of 1000 mg of calcium per 15 gram serving are:

DETD

Dough-Up Ingredients      Parts by Weight

Wheat flour (about 13% by weight water)

36

Soybean oil, purified      7.5

Minor ingredients (salt and sodium

2.53

bicarbonate)

Sodium stearoyl lactylate

0.25

Ground limestone (food grade, at least 94%

5.625

by weight calcium carbonate)

Polysorbate. . .

DETD

Topping Ingredients

Parts by weight

Salt      3.0

Soybean oil, purified

2.5

DETD . . . from Bush Boake Allen, Chicago, Illinois. In addition to the polysorbate 60 carrier, the natural flavor composition includes water, soybean oil, sesame oil, partially hydrogenated corn oil, TBHQ as an antioxidant, and sodium benzoate as a preservative. The premix has a white to off-white color and a . . .

DETD . . . (calcium carbonate), and sodium stearoyl lactylate are added on

top of the dough-up flour, followed by addition of the soybean oil. The dough is mixed, then proofed for 2-5 hours. The proofed dough is then sheeted, the sheeted dough is laminated,. . . by

weight

to about 4.0% by weight and a pH of about 6.8 to 8.0. The topping salt and topping oil may then be applied to obtain the finished

product.

DETD The ingredients and their relative amounts, which may be used to produce

a calcium enriched, fat-free, fermented **cracker** dough bakeable to a **cracker** which provides at least 20% of the U.S. R.D.A. of 1000 mg of calcium per 15 gram serving, are:

DETD . . . Weight

Wheat flour (about 13% by weight	64
water)	
Barley Malt flour (about 10% by weight	0.32
water)	
Yeast	0.1
Starter solution (protease and	1
previous batch starter)	
<b>Cracker</b> meal	2
Water	30.4
TOTAL	97.82

DETD . . . from Bush Boake Allen, Chicago, Ill. In addition to the polysorbate 60 carrier, the natural flavor composition includes water, soybean **oil**, sesame **oil**, partially hydrogenated corn **oil**, TBHQ as an antioxidant, and sodium benzoate as a preservative. The premix has a white to off-white color and a . . .

DETD The ingredients and their relative amounts, which may be used to produce

a 35%-reduced-fat, unfermented **cracker** which provides at least 1000 mg of calcium per 15 gram serving, are:

DETD

Dough Ingredients	Parts by weight
-------------------	-----------------

Wheat flour (about 13% by weight water)	100
Ground limestone (calcium carbonate) of	6.0
Example 1	
Sucrose	5.55
Soybean <b>oil</b> , purified	3.00
Whey powder	3.00
Glucose syrup (43 BE/62 DE)	1.78
Minor ingredients (salt, butter flavor, amylase,	2.00
protease)	
Ammonium bicarbonate	1.33
Sodium bicarbonate	0.33
Sodium stearoyl. . .	

DETD

Topping Ingredients	Parts by weight
---------------------	-----------------

Salt	2.38
Shortening (soybean spray <b>oil</b> )	6.75

DETD . . . a pH of about 6.6 to 8.2. The topping ingredients may then be applied to obtain a finished calcium enriched **cracker** having a 35% reduction in fat content.



DETD The ingredients and their relative amounts, which may be used to produce

a calcium enriched, low-fat, fermented **cracker** dough bakeable to a **cracker** which provides at least of the U.S. R.D.A. of 1000 mg of calcium per 15 gram serving are:

DETD

Dough-Up Ingredients      Parts by Weight

Wheat flour (about 13% by weight water)

36

Soybean oil, purified 1.48

Minor ingredients (salt and sodium

1.16

bicarbonate)

Sodium stearoyl lactylate

0.5

Ground limestone (calcium carbonate) of

5.625

Example 1

Polysorbate 60 0.25

Natural flavorant 0.75

TOTAL. . .

DETD

Topping Ingredients

Parts by weight

Salt 3.0

Soybean oil, purified

2.5

DETD . . . from Bush Boake Allen, Chicago, Ill. In addition to the polysorbate 60 carrier, the natural flavor composition includes water, soybean oil, sesame oil, partially hydrogenated corn oil, TBHQ as an antioxidant, and sodium benzoate as a preservative. The premix has a white to off-white color and a . . .

DETD . . . (calcium carbonate), and sodium stearoyl lactylate are added on

top of the dough-up flour, followed by addition of the soybean oil. The dough is mixed, then proofed for 2-5 hours. The proofed dough is then sheeted, the sheeted dough is laminated, . . . by weight

to about 4.0% by weight and a pH of about 6.8 to 8.0. The topping salt and topping oil may then be applied to obtain the finished low-fat product.

CLM What is claimed is:

15. A dough as claimed in claim 1 wherein said dough is a **cracker** dough having a moisture content of about 25% by weight to about 33% by weight, based upon the weight of. . .

17. A **cracker** dough for producing a calcium enriched **cracker** which provides at least about 10% of the 1000 mg U.S. R.D.A. of calcium per 15 gram serving, the dough. . . being based upon the weight of said flour, and an emulsifier composition which reduces hardness and dry mouthfeel of said **cracker** caused by said calcium component, said emulsifier composition comprising: a) an effective emulsifying amount of at least one polyoxyethylene sorbitan.

18. A **cracker** dough as claimed in claim 17 wherein said polyoxyethylene sorbitan fatty acid ester is polysorbate 60, and said stearoyl lactylate. . .

19. A **cracker** dough as claimed in claim 17 wherein said

calcium component comprises calcium carbonate.

20. A **cracker** dough as claimed in claim 17 wherein said calcium component provides at least 200 mg of calcium per 15 grams.

22. A calcium enriched **cracker** which provides at least about 20% of the 1000 mg U.S. R.D.A. of calcium per 15 gram serving, said **cracker** comprising flour, water, from about 3% by weight to about 30% by weight of calcium carbonate, said weight percentages of.

. being based upon the weight of said flour, and an emulsifier composition which reduces hardness and dry mouthfeel of said **cracker** caused by said calcium carbonate, said emulsifier composition comprising: a) an effective emulsifying amount of at least one polyoxyethylene sorbitan. . . weight to about 45% by weight, based upon the weight of said calcium carbonate, and the moisture content of said **cracker** being less than about 6% by weight.

23. A dough, for producing reduced-fat, low-fat or no-fat calcium enriched **crackers** which provide at least about 200 mg of calcium per 15 gram serving, comprising flour, water, from about 3% by.

30. A method as claimed in claim 29 wherein said dough is a **cracker** dough, and the **cracker** dough is sheeted, laminated, and then cut into pieces.

34. A method as claimed in claim 33, wherein the dough is baked to obtain a low-fat **cracker**.

35. A method for producing calcium enriched soda **crackers** which provide at least about 200 mg of calcium per 15 gram serving comprising: (a) admixing flour and water to. . . 30% by weight,

based

upon the weight of said flour, said emulsifier composition reducing hardness and dry mouthfeel of said **cracker** caused by said calcium component said emulsifier composition comprising: a) an effective emulsifying amount of at least one polyoxyethylene sorbitan.

L9 ANSWER 3 OF 5 USPATFULL

AB The present invention is directed to a baked food composition comprising food ingredients and a water-soluble cellulose ether which is useful for

reducing the low-density lipoprotein serum cholesterol level of an animal. Use of a specific particle-size distribution of the water-soluble cellulose ether results in compositions which are more palatable than known compositions.

PI US 5281584

19940125

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SUMM

It is known that soluble vegetable **fibers** such as psyllium, guar, and **.beta.-glucans** may exert cholesterol lowering effects, but these soluble **fibers** are not very efficacious on a per gram basis. Also, because soluble vegetable **fibers** are easily metabolized by colonic bacteria (causing extensive anaerobic production of methane, carbon dioxide, and hydrogen), these vegetable **fibers** are known to cause gross flatulence, bloating and grave abdominal discomfort when administered

in

therapeutically effective doses. Furthermore, psyllium seed. . .

DETD Examples of baked food compositions are well known and include those

such as cookies, cakes, biscuits, pies, **crackers**, wafers, muffins, granola bars, and bread. A preferred composition comprises a dosage amount of water-soluble cellulose ether in a cookie. . . .

DETD . . . baking and include solid or plastic, as well as liquid or semi-fluid, glyceride shortenings derived from animal, vegetable fats and **oils** including synthetically prepare shortenings. These glycerides can contain saturated or unsaturated "long-chain" acyl radicals having from about 12 to about. . . . myristoleoyl, palmitoyl, palmitoleoyl, stearoyl, oleoyl, linoleoyl, linolenoyl, arachidoyl, arachidonoyl, behenoyl, erucoyl, and the like and are generally obtained

from edible **oils** and fats such as corn **oil**, cottonseed **oils**, soybean **oil**, coconut **oil**, rapeseed **oil**, peanut **oil**, olive **oil**, palm **oil**, palm kernel **oil**, sunflower seed **oil**, safflower **oil**, lard, and tallow.

DETD Some preferred shortenings are butter, soybean-based shortenings or **oils**, hydrogenated soybean-based shortening or **oil**, corn **oil**, palm **oil**, hydrogenated palm **oil**, lard and tallow **oils**. It is preferred that the shortening used in the present invention be in fluid form, i.e., liquid at room temperature. . . .

DETD . . . remain as whole pieces in the cookie. Such additives include, but are not limited to, chocolate, peanut butter or butterscotch **chips** or chunks, fruit or fruit-flavored bits, such as blueberry, strawberry, or citrus flavored bits, or other fruit flavored bits, such. . . .

DETD . . . added to provide a variety of desirable products. The cookies of the present invention are well-suited to compositions with high **oil** contents. The exact amount added for any of these flavoring components (whether they are of the type that is blended. . . .

DETD 5. do not produce the allergic responses characteristic of many known vegetable **fibers**, and

DETD . . . those skilled in the medical and pharmaceutical arts do not currently understand the full mode of action of soluble dietary **fibers** in the process of cholesterol lowering. What is evident from the findings of this invention is that by providing the human body a generous supply of benign soluble dietary **fiber** in the form of a high-viscosity grade cellulose ether, natural human body processes are mobilized and assisted to achieve reductions. . . .

L9 ANSWER 4 OF 5 USPATFULL

AB The present invention relates to a reduced-fat, ready-to-eat food item comprising a cereal component, a water-soluble dietary **fiber** composition component, and a binding agent component, wherein a sufficient amount of each component is used to provide for said food item to be formed into a desired shape and maintain said shape.

PI US 5275830 19940104 <--

AB The present invention relates to a reduced-fat, ready-to-eat food item comprising a cereal component, a water-soluble dietary **fiber** composition component, and a binding agent component, wherein a sufficient amount of each component is used to provide for said. . . .

SUMM The present invention relates to a reduced-fat, ready-to-eat food item comprising a cereal component, a water-soluble dietary **fiber** composition component, and a binder component. In a preferred embodiment, the present invention comprises a reduced-fat, ready-to-eat granola food bar. . . .

SUMM . . . in the preparation of the bar. Fat may be added as a binding agent and/or in the form of an **oil**, which acts to keep the

food bar tender and imports other desirable organoleptic properties, such as flavor and mouthfeel. When the **oil** is not added, or is replaced with water and sugar syrup, the resulting food bar has a poor texture in. . . and brittle, and thus is typically not as acceptable to consumers. In the present invention, however, when the water-soluble dietary **fiber** composition of the present invention is added to food items, particularly food bars, as a replacement for such **oils**, it has been surprisingly found that a reduced-fat, ready-to-eat food item can be prepared with few, if any, of these. .

SUMM . . . syrup, crisp rice, sugar,, glycerin, shortening, salt and other

flavorings, and antioxidants. The food bar also may contain nuts, chocolate **chips**, and dried fruit. The granola mix typically comprises oat and wheat flakes, peanuts, whey solids, milk solids, coconut, sugar, corn syrup, **oil**, and honey. The **oil** is typically added to the granola mix to keep the product tender.

SUMM A process for preparing water-soluble dietary **fiber** compositions from oats is also known to those skilled in the art. U.S. Pat. No. 4,996,063, issued Feb. 26, 1991 to Inglett, teaches preparing water-soluble dietary **fiber** compositions by treating an aqueous dispersion of a gelatinized, milled, oat substrate with an insoluble

fraction, separating said soluble fraction from said insoluble fraction, and recovering from said soluble fraction said water-soluble dietary **fiber** substantially free of water-insoluble **fiber**.

SUMM However, neither of these references teach or suggest that the water-soluble dietary **fiber** prepared in accordance with the process of the '063 patent would be useful as a partial or total replacement for the **oil** in the food item of the present invention, or that such replacement would provide a food item having a lower. . .

SUMM The present invention relates to a reduced-fat, ready-to-eat food item comprising a cereal component, a water-soluble dietary **fiber** composition component, and a binding agent component, wherein a sufficient amount of each component is used to provide for said. . .

DETD The present invention relates to a reduced-fat, ready-to-eat food item comprising a cereal component, a water-soluble dietary **fiber** component, and a binding agent component, all of which are combined and may be formed into a desired shape, preferably. . .

DETD In a preferred embodiment, the cereal and water-soluble dietary **fiber** components are combined to form an initial mixture, and said initial mixture is then combined with the binding agent component. . .

DETD Water-Soluble Dietary **Fiber** Component

DETD The food item of the present invention also comprises a sufficient amount of a water-soluble dietary **fiber** composition component to provide for said food item to be formed into and maintain a desired shape, typically from about. . . about 0.8% to about 1.3% by weight of the ready-to-eat food item. As will be discussed later, the water-soluble dietary **fiber** composition may also be utilized as an optional ingredient of the binding agent. The percentages set forth here do not include water-soluble dietary **fiber** composition as such an optional ingredient, but only include water-soluble dietary **fiber** composition as a component of the ready-to-eat food item separate from the binding agent.

DETD The water-soluble dietary **fiber** composition comprises a

mixture of maltodextrin and **beta-glucans** at a ratio sufficient to impart softening and tenderizing properties to the ready-to-eat food item, typically at a ratio of. . .

DETD This maltodextrin and **beta-glucans** mixture may be obtained by any means known to those skilled in the art. For example, maltodextrin and **beta-glucans** may be obtained separately and then combined. In such a case, the betaglucans may be in a purified form or may be in combination with other agents. As an example, cellulose gum contains **beta-glucans** and can be combined with the maltodextrin to prepare the water-soluble dietary **fiber** composition of the present invention.

DETD The water-soluble dietary **fiber** composition may also be prepared by treating a processed **beta-glucan** containing grain with alpha-amylase to form a maltodextrin and **beta-glucan** containing mixture. In a preferred embodiment, the water-soluble dietary **fiber** composition is prepared by a method comprising treating an aqueous dispersion of a gelatinized, milled **beta-glucan** containing grain substrate with an alpha-amylase under conditions which will hydrolyze the substrate and yield a soluble fraction and an. . . being more preferred, and a single decanting step being most preferred; and recovering from said soluble fraction said water-soluble dietary **fiber** substantially free of water insoluble **fiber**, in accordance generally with the method described in U.S. Pat. No. 4,996,063, issued Feb. 26, 1991 to Inglett, the disclosure of which is incorporated herein by reference, or by any method providing an equivalent product. Examples of **beta-glucan** containing grain substrates include, but are not limited to, oat, rice and barley, with oat being preferred. For use in. . .

DETD . . . agent for convenience. These ingredients may be first combined and then added as combined to the cereal and water-soluble dietary **fiber** composition components. Alternatively, the cereal, water-soluble dietary **fiber** composition, and individual binding agent ingredients may be either combined simultaneously or sequentially, in no particular order, to prepare the. . .

DETD In a preferred embodiment, the binding agent may also comprise the water-soluble dietary **fiber** composition as already described herein. The water-soluble dietary **fiber** composition is combined with the binding agent prior to the binding agent being combined with the cereal and water-soluble dietary **fiber** composition components.

DETD . . . syrup comprising from about 0.5% to about 3%, more preferably from about 1.5% to about 2.5% by weight water-soluble dietary **fiber** composition; from about 3% to about 15% by weight high maltose corn syrup; from about 3% to about 15% by. . .

DETD As already stated herein, in a preferred embodiment the cereal and water-soluble dietary **fiber** composition components are first combined to form an initial mixture, and said initial mixture is then combined with the binding agent to form the ready-to-eat food item. The amount of cereal and water-soluble dietary **fiber** composition components contained in the initial mixture are those amounts necessary to form the final food item into a desired. . .

DETD The coating component used to prepare this granola cereal comprises sugar,, water-soluble dietary **fiber** composition, and a sugar solution.

DETD The water-soluble dietary **fiber** composition included in the coating component is as already described herein.

DETD . . . comprises from about 5% to about 9% by weight sugar, from about 0.8% to about 1.3% by weight water-soluble dietary **fiber**

composition, from about 0.3% to about 6% by weight of a sugar solution, and sufficient water to make the coating. . . .

DETD . . . comprising from about 5% to about 9% by weight sugar, from about 0.8% to about 1.3% by weight water-soluble dietary **fiber** composition, from about 0.3% to about 6% by weight honey, and sufficient water to make the coating component liquid;

DETD . . . about 1% to about 7% by weight corn syrup solids; from about 1.5% to about 2.5% by weight water-soluble dietary **fiber** composition, from about 1% to about 6% by weight glycerol; from about 0.5% to about 2% by weight sorbitol; and. . . .

DETD . . . dates, apples, strawberries, blueberries, cranberries, raspberries, and mixtures thereof. The dehydrated fruit may be combined with the cereal, water-soluble dietary **fiber** composition, and binding agent components in any order prior to shaping, including simultaneously or in any sequential order. In a. . . .

DETD . . . spirit of the reduced-fat nature of the food item of the present invention, and therefore are not preferred, include chocolate **chips**, chocolate filling, chocolate covering, confectioner's coatings, and mixtures thereof.

DETD The cereal, water-soluble dietary **fiber** composition, and binding agent components may be combined by any method known to those skilled in the art to form. . . . time sufficient to obtain a substantially uniform interdispersion of the individual ingredients; combining the cereal component and the water-soluble dietary **fiber** composition component, along with other certain desirable optional ingredients, to form an initial mixture and then coating the initial mixture. . . .

DETD As already described herein, in a preferred embodiment of the claimed process, the cereal and water-soluble dietary **fiber** composition components are combined to form an initial mixture, and the initial mixture is then combined with the binding agent. . . .

DETD . . . admixing from about 5% to about 9% by weight sugar, from about 0.8% to about 1.3% by weight water-soluble dietary **fiber** composition, from about 0.3% to about 6% by weight of a sugar solution, and sufficient water to make the coating. . . .

DETD . . . method known to those skilled in the art, including those already described herein for combining the cereal and water-soluble dietary **fiber** composition components of the initial mixture. It is preferred that the granola cereal and processed grain be combined under conditions. . . .

DETD . . . admixing from about 5% to about 9% by weight sugar, from about 0.8% to about 1.3% by weight water-soluble dietary **fiber** composition, from about 0.3% to about 6% by weight honey, and sufficient water to make the coating component liquid;

DETD . . . f rom about 1% to about 7% by weight corn syrup solids; from about 1.5% to about 2.5% water-soluble dietary **fiber** composition; from about 1% to about 6% by weight glycerol; from about 0.5% to about 2% by weight sorbitol; and. . . .

DETD A water-soluble, dietary **fiber** composition is prepared in accordance with the process as described in U.S. Pat. No. 4,996,063, issued Feb. 26, 1991 to Inglett, wherein a single decanting step is used to separate the soluble **fiber** and insoluble **fiber** in said process.

DETD . . . a mixer. A coating syrup is prepared by admixing 7.8 grams brown sugar with 1.9 grams of the water-soluble dietary **fiber** composition, 1.2 grams honey, and 3.6 grams water. This coating component is mixed together and heated to a temperature of. . . .

DETD . . . grams high fructose corn syrup, 9.7 grams high maltose corn syrup, 5.6 grams corn syrup solids, 2.3 grams water-soluble dietary **fiber** composition, 4.8 grams honey, 4.8 grams glycerin, 1.6 grams sorbitol, and 0.1 grams salt and other flavorings.

DETD Example 1 is repeated with the exception that the water-soluble dietary **fiber** composition is added in the form of a gel containing 2.1 grams water-soluble dietary **fiber** composition and 6.3 grams water, instead of in a dry form.

DETD Example 1 is repeated with the exception that the dried food item is additionally admixed with 8 grams chocolate **chips** and 8 grams peanut butter. Again, the resulting product is a highly desirable, ready-to-eat food item.

CLM What is claimed is:

1. A reduced-fat, ready-to-eat food item comprising a cereal component, a water-soluble dietary **fiber** composition component, and a binding agent, wherein a sufficient amount of each component is used to provide for said food item to be formed into a desired shape and maintain said shape, wherein said water-soluble dietary **fiber** composition component is prepared by method comprising treating an aqueous dispersion of a gelatinized, milled **beta-glucan** containing grain substrate with an alpha-amylase under conditions which will hydrolyze the substrate and yield a soluble fraction and an insoluble fraction, separating said soluble fraction from said insoluble fraction, and recovering from said soluble fraction said water-soluble dietary **fiber** substantially free of water insoluble **fiber**.
- . . . 5. A food item according to claim 2 comprising from about 0.6% to about 10% by weight of water-soluble dietary **fiber** composition component.
6. A food item according to claim 5 wherein the water-soluble dietary **fiber** composition component comprises maltodextrin and **beta-glucans** in a ratio in the range of from about 3:1 to about 15:1.
7. A food item according to claim 6 wherein the **beta-glucan** containing grain substrate is an oat substrate.
- . . . according to claim 9 wherein the binding agent further comprises from about 0.5% to about 3% by weight water-soluble dietary **fiber** composition, based upon the total weight of the binding agent.
- . . . claim 10 wherein the binding agent is a syrup comprising from about 1.5% to about 2.5% by weight water-soluble dietary **fiber** composition; from about 3% to about 15% by weight high maltose corn syrup; from about 3% to about 15% by . . .
12. A food item according to claim 9 wherein the cereal and water-soluble dietary **fiber** composition components are first combined to form an initial mixture, said initial mixture is then combined with the binding agent. . .
- . . . comprises from about 5% to about 9% by weight sugar, from about 0.8% to about 1.3% by weight water-soluble dietary **fiber** composition, from about 0.3% to about 6% by weight of a sugar solution, and sufficient water to make the coating. . . and wherein said enrobed base is dried to moisture content of below about 3.5 percent and wherein said water-soluble dietary **fiber** composition is prepared by a method comprising treating an aqueous dispersion of a

gelatinized, milled **beta-glucan** containing grain substrate with an alpha-amylase under conditions which will hydrolyze the substrate and yield a soluble fraction and an insoluble fraction, separating said soluble fraction from said insoluble fraction, and recovering from said soluble fraction said water-soluble dietary **fiber** substantially free of water insoluble **fiber**; and (b) sufficient binding agent to provide for said dry mix to be formed into a desired shape and maintain. . . . comprising from about 5% to about 9% by weight sugar, from about 0.8% to about 1.3% by weight water-soluble dietary **fiber** composition, from about 0.3% to about 6% by weight honey, and sufficient water to make the coating component liquid; wherein. . . wherein said enrobed base is dried to a moisture content of below about 3.5 percent and wherein said water-soluble dietary **fiber** composition is prepared by a method comprising treating an aqueous dispersion of a gelatinized, milled **beta-glucan** containing grain substrate with an alpha-amylase under conditions which will hydrolyze the substrate and yield a soluble fraction and an insoluble fraction, separating said soluble fraction from said insoluble fraction, and recovering from said soluble fraction said water-soluble dietary **fiber** substantially free of water insoluble **fiber**; and (b) from about 10% to about 35% by weight of a syrup binding agent, wherein said syrup binding agent. . . about 1% to about 7% by weight corn syrup solids; from about 1.5% to about 2.5% by weight water-soluble dietary **fiber** composition, from about 1% to about 6% by weight glycerol; from about 0.5% to about 2% by weight sorbitol; and. . .

L9 ANSWER 5 OF 5 USPATFULL

AB Breakfast cereals are sweetened by treating cereal grains or at least one cereal grain fraction such as bran, with enzymes comprising glucoamylase and glucose isomerase to produce fructose while retaining cereal particle discreteness or integrity. Enzymatic treatment with alpha-amylase may be initiated prior to, during, or after cooking. The enzymatically treated, cooked cereal grains are formed into breakfast cereal shapes and the enzymes are inactivated to provide a shelf-stable cereal product. The cereal products exhibit a sweet, pleasing complex-honey-like taste and aroma. Producing fructose provides a greater level of sweetness for a given amount of starch conversion into low molecular weight reducing sugars such as mono- and di-saccharides. In achieving a given level of sweetness, more starch or high molecular weight dextrans may be retained for their matrix forming ability or for improved machineability of the enzymatically treated cereal grains into breakfast cereal shapes. The naturally sweetened cereal products of the present invention may be in shredded, flaked, ground, or extruded form.

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SUMM U.S. Pat. No. 4,247,636 teaches the production of a fructose sweetener from an impure starch source containing **beta glucans**. Here, impure flour and water are mixed and then treated with the enzyme beta glucanase to produce a slurry having. . .

SUMM . . . The enzymes, cellulase and hemi-cellulase, are either added per se or after a preserving treatment. Food products such as cakes, oils rich in cellulose, fish waste, etc. are produced.

SUMM . . . No. 4,311,714 teaches a process for making protein products and maltose syrup from flour obtained from a waxy barley grain. **Beta**



-**glucans** contained in barley starch solids are partially hydrolyzed. Proteins are released and starch is at least partially hydrolyzed to obtain. . . solids removed from the starch. Use of a wax grain, it is taught, is critical because of amylopectin content.

The

**beta-glucans** are removed to facilitate working on the barley. Bran, a by-product, is separated from the grain and not subjected to. . .

SUMM

. . . the grain is achieved without separating the starch from the grain or from the other dry substances such as gluten, **fibers**, and husks.

SUMM

. . . the other reducing sugars produced during the enzymatic treatment. The fructose which is produced also provides a honey-type or graham **cracker**-type taste and aroma. The fructose content of the cereal products of the present invention is at least about 1% by.

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